

## OUR BOOK SHELF

*Studies from the Physiological Laboratory in the University of Cambridge.* Edited by the Trinity Praelector in Physiology. Part III. (Cambridge: Printed at the University Press, 1877.)

THIS volume of 165 pages, together with numerous elaborate plates—the largest of the Cambridge Biological "Studies" yet published—is a most pleasing indication of a vigorous spirit of research in a body which has by many been thought to be solely educational. It is not, indeed, the number of the memoirs and papers here collected, but their quality, which makes them worthy of the university whose name they bear on the title-page. In quantity they are far from commensurate with the latent means and opportunities of the colleges and University of Cambridge, but in their thoroughness and dignity they display a spirit which would do honour to any university. They represent a new feature in the history of biological science in this country, viz., the recognised official charge of biological research in high places, where it has been too long neglected. The Biological and Physiological School of Cambridge is a rare and valuable "sport" in the offspring of an organism of decided conservative tendencies: may we not hope that, ere long, Oxford will give birth to a similar healthy monster?

All the papers of this volume have been published before in the *Journal of Anatomy and Physiology*, or elsewhere; but we are not the less glad, on that account, to see the present collection. If the cause of scientific research were more secure in England than it is, the publication of special collections of memoirs of the various schools might be held to be an unnecessary luxury, or even—since rivalry may become ungenerous—a positively dangerous habit. Under our present conditions, however, it is not only pleasant to be reminded now and again of the various centres of organised research among us, but it materially strengthens the hands of English scientific workers to invest the different growing schools with somewhat of a personal and individual interest.

The volume contains physiological and anatomical papers, chiefly in zoology, but also in botany. Dr. Michael Foster and Mr. Dew-Smith contribute a most interesting paper on the effects of the constant current on the heart, which is a continuation of the work they did on the reaction of the snail's heart to electrical currents. Mr. J. N. Langley has a paper on the action of pilocarpin on the submaxillary gland of the dog. Mr. Gaskell reprints one of his papers on the vaso-motor nerves of striated muscles. Mr. F. M. Balfour contributes an important section of his now published monograph on the development of elasmobranch fishes, viz., the development of their spinal nerves; as well as a paper on the spinal nerves of amphioxus. Mr. Marshall follows with a paper on the development of the nerves in birds. Mr. Bullar has a paper, with plates, on the generative organs of parasitic isopoda; Mr. Bridge one on the cranial osteology of *Amia calva*, also admirably illustrated; and Mr. Sidney Vines a short communication on the digestive ferment of nepenthes.

*The American Quarterly Microscopical Journal, containing the Transactions of the New York Microscopical Society.* Edited by Romyn Hitchcock. Vol. I., No. 1. October. (New York: Hitchcock and Hall, 1878.)

COMMENCING as this new journal does, on the lines of our own *Quarterly Journal of Microscopical Science*, and somewhat under the like auspices, we trust it may have the same worthy career, and be equally well thought of. The first number is beautifully printed on excellent paper, and contains some eighty-two pages belonging to the journal proper, while the *Transactions* of the New York Microscopical Society extend to some sixteen pages more.

The six plates, on their part, are good, but not up to the same standard of execution as the letterpress, and fall a good deal below those that generally appear in our own microscopical journal. The chief contents of this part are—1. On the Sting of the Honey Bee, by J. D. Hyatt. Plates I. and II. 2. Description of some New Species of Diatoms, by H. L. Smith. Plate III. 3. Observations on several Forms of Saprolegniaceæ, by F. B. Hine. Plates IV. to VI. Only the first part of this paper is given, and the list of works referred to by the author is given at the end of the paper, so perhaps it may be premature to suggest that English writers on this subject are not altogether wanting, as he would seem to think; but has he not Dr. Lindstedt's Synopsis, and does not this refer to such? 4. The Oil Immersion Lenses of Zeiss compared with the Objectives of Spencer and Sons, by H. L. Smith. 5. On the Microscopical Examination of Fibers (fibres?), by W. H. Seaman. 6. Emigration in Passive Hyperæmia, by W. T. Belfield. 7. On a New Device for Dark-field Illumination, by W. Leighton. Among the shorter articles we may mention one reprinted, with full acknowledgment, on the Spore Formation in the Mesocarpeæ, from our own columns, and an account of the National Microscopical Congress held last August at Indianapolis, Indiana.

## LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

## Locusts and Sun-Spots

As the locust (*Edipoda migratoria*, or *Acridium perigrinum?*) is a frequent and occasionally aggravating accompaniment of drought and famine, it cannot but be interesting to notice that periodical incursions of this insect into the temperate zone are apparently regulated in some way by the terrestrial meteorological abnormalities which accompany the varying phases of the sun-spots.

Dr. F. G. Hahn, in his treatise "Ueber die Beziehungen der Sonnenfleckenperiode zu meteorologischen Erscheinungen," after remarking that locusts will probably only visit the temperate regions in great numbers during unusually hot and dry years (on account of the brood), and abandon them again in wet and cold years, shows, from a list furnished by Dr. W. Köppen, of Hamburg, embracing the period 1800-1862, that in Europe they begin coming about the epoch of minimum sun-spot, paying annual visits from thence up to the epoch of maximum sun-spot, after which they disappear altogether until the next following epoch of sun-spot minimum.

In the following table I give Dr. Hahn's dates for their visitations in Europe, with some additional ones on the authority of M. Camille Flammarion, and Mr. Walford of the Statistical Society, which include other regions of the north temperate zone. I also give the corresponding sun-spot epochs in each case, according to Wolf. The capital letters in parentheses attached to the dates, indicate the authorities respectively alluded to above.

Date of Visitation in Temperate Zone.	SUN-SPOTS.	
	Min.	Max.
1613 (F)	1610.8	1615.0
1690 (F)	1689.5	1693.0
1748 <sup>1</sup> -1749 (F)	1745.0	1750.3
1800 annually up to 1806 (H)	1798.3	1804.2
1811 , , 1816 (H)	1810.6	1816.4
1820 , , 1829 (H)	1823.3	1829.9
1832 (F) 1834 (F) 1837 annually up to 1839 (H)	1833.9	1837.2
1844 annually up to 1848 (H)	1843.5	1848.1
1855 , , 1862 (H)	1856.0	1860.1
1866 (F) , , 1868 (W)	1867.2	1870.6
1874 annually up to 1878 (W)	1877(?)	—

<sup>1</sup> See Gentleman's Magazine for July, 1748, pp. 331 and 414.

The remarkable fact displayed in his portion of the above table, that locusts only make their appearance in great numbers in the interval from minimum to maximum sun-spot and never during the interval from maximum to minimum sun-spot, is evidently regarded by Dr. Hahn as affording some additional collateral proof in favour of the relation he had already partially established between the rainfalls of Central Europe and the sun-spots, viz., that the interval from minimum to maximum sun-spot is in general drier and warmer than that from maximum to minimum sun-spot. The added dates apparently exhibit a relation to the sun-spot epoch similar to those given by Dr. Hahn.

Whether the laws which regulate the visitations of locusts are the same in other parts of the world or not, it is at all events suggestive to notice that the dates of their general appearance throughout the world, given by Mr. Walford in a recent paper to the Statistical Society, entitled, "Famines of the World, Past and Present," exhibit the same relation to the sun-spots as that noted by Dr. Hahn in the case of their visits to Europe.

The date of apparition, the locality visited, and the epoch of sun-spot minimum corresponding, are given below.

Date of Apparition.	Locality visited.	Epoch of Minimum Sun-Spot.
1802	India	1798·3
1812-13	"	1810·6
1833-35	"	1833·9
1855	United States	1856·0
1868	"	1867·2
1874-77	"	1877(?)
1878	{ China, Spain, Algeria, } Bosnia, India	1877(?)

In the face of such an apparent predilection on the part of locusts to swarm during the minimum epoch of sun-spots, it might, I think, be advantageous to institute an extensive comparison of all past visitations of these insects with the eleven-year cycle of sun-spots. This after due allowance had been made for any known natural cycles of incubation, might possibly bring to light a physical cycle of visitation, the size and position of the area affected by which would, perhaps, afford some indication of the corresponding limits of the rainfall variation.

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#### The Range of the Mammoth

THE criticism by Mr. Clement Reid of my paper recently read before the Geological Society, and not yet published, renders it necessary to remind him that his views as to the mammoth not being pre-glacial are not new, but were advanced by me ten years ago (*Pop. Science Review*, 1868, p. 275; *Geol. Mag.*, v. 7, July, 1868), and afterwards given up by the light of a wider experience. His arrangement of the complicated glacial deposits of Britain in one linear series, like all similar attempts, appears to me to be based on the fallacy that a difference in the character of the strata, in different areas, implies a difference in point of time. His divisions seem to me purely local, and mostly peculiar to the eastern counties. I see no reason for believing that, while five out of the six proposed were being accumulated east of the Pennine chain, there were no glacial phenomena in the west, in Lancashire or Cheshire, until the last phase, or the sixth of the eastern divisions; or, in other words, that the lower boulder clay of Lancashire and Cheshire is the equivalent of the last division. On the contrary, the marine sands and gravels covering the lower boulder clays, on both sides of the Pennine chain, and occupying a large area round Crewe, Stafford, and in the Trent Valley, is to me a well-marked horizon, defining the upper from the lower series of boulder clays. It is very likely that the lower boulder clay of Lancashire and Cheshire is the equivalent of the lower boulder clay series of Norfolk and Suffolk, as well as of the "moraine profonde" of Scotland. It must, however, be admitted that the correlation of the glacial deposits in various parts of Britain has not yet been satisfactorily made out. "Tot homines quot sententiae."

To group them, as they are frequently now grouped, in one linear series, seems to me almost as useless as to construct a history of Europe in which the dynasties ruling various kingdoms at the same time are described one after another, and taken to belong to different periods because they were different dynasties.

W. BOYD DAWKINS

#### Fossil Floras of the Arctic Regions

THE author of the valuable paper communicated in NATURE, vol. xix. p. 124, on "The Fossil Floras of the Arctic Regions," will find in an essay of mine, entitled "Thalassa," and published in the course of last year, a number of facts and arguments in corroboration of his views regarding the influence of oceanic currents upon climate. In this essay, which is mainly founded upon the observations made on board H.M.S. *Challenger*, I have endeavoured to show how a relatively trifling elevation or depression of the sea-coast or of the bed of the ocean may considerably alter the configuration of an oceanic basin; how such an alteration must affect the direction, volume and temperature of existing currents, and thus have a tendency to change the climate and ultimately the distribution of animal and plant life in the regions bordering on the oceanic basin. I also (p. 29-30) ventured to express the opinion that "it appears hardly necessary to go in search of vast cosmic changes, such as an alteration in the position of the terrestrial axis, a diminution in the amount of solar heat . . . while we have, close at hand, an agency whose effect upon climatic conditions may be said to be a matter of daily experience, and which is sufficiently powerful to establish, in almost any region on the earth's surface, the small difference of temperature which is a decree of life or of death to numerous animal and vegetable organisms." To this I may now add, that the influence of oceanic currents upon climate and upon the distribution of life will be most felt and produce the most remarkable results in the Arctic and sub-Arctic regions, which, as we know, may at one period be swept by powerful polar currents, at another invaded by vast masses of warm water brought there by currents from the tropical regions, such, for example, as the Gulf Stream.

The facts brought to light by recent sounding-operations regarding the configuration of the sea-bottom and the distribution of oceanic depths has led me to the conclusion that our continents and oceanic basins, such as they appear at the present day, are of immense antiquity; that changes in the distribution of land and water require for their accomplishment long periods, which, for all we know, may alternate with periods of repose or even of retrocession; and that, consequently, the influence of these changes upon currents and upon climate must be equally slow and uncertain in its duration. If, therefore, the effect of oceanic currents upon climate appears as an important factor, which can no longer be neglected in any discussion on the flora and fauna of past geological epochs, on the other hand, the slow and uncertain progress of the changes above mentioned seems to afford ample scope for the operation of other causes which, besides climate and temperature, determine the existence of certain species in a given area of the earth's surface.

J. J. WILD

#### The Microphone

TWO subjects of interest in connection with the practical application of the microphone have lately been brought to my notice by Raja Sir T. Madava Row, K.C.S.I., Dewan of Baroda. In the hope of securing a little assistance from some of your scientific readers I hasten to lay them before you.

The first question is with reference to the use of a microphone as a stethoscope. It seems that native ladies of high position decline altogether to allow a doctor to examine the chest in the ordinary manner. Sooner than submit to such an examination they would prefer to die—certainly rather a staggering fact for those imbued with European ideas. In the cause of humanity it is therefore desirable to do something for those whose position and caste would be imperilled by *direct* examination. If the microphone could be so delicately arranged as to transmit the auscultatory sounds, a medical ear, even at a distance, would surely be able to detect the existence of any disease of the heart or lungs. In the few experiments that we have made with our limited appliances we have been able to hear the ticking of a watch at a distance of about 200 yards, and the roar of a black ant when attacked by his companion, but as yet we have heard no internal sounds from the human breast. Perhaps with better devised instruments some one may have been able to obtain that which has yet been denied to us. I am sure many native ladies would be glad to get an affirmative answer to the question, "Can the microphone be used as a stethoscope?"

The second subject seems to me to be a much more difficult one to grapple with. Sir Madava Row writes to me as follows:—